

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Previously Presented): A process for the preparation of an aqueous polymer dispersion by free radical aqueous emulsion polymerization comprising polymerizing at least one ethylenically unsaturated compound (monomer) in the presence of at least one dispersant, wherein

- a) into a reaction vessel at a temperature which is less than or equal to the starting reaction temperature T_S ,
 - a₁) at least one portion of demineralized water,
 - a₂) at least one portion of at least one oil-soluble free radical initiator,
 - a₃) at least one portion of at least one dispersant,
 - a₄) optionally, a portion of the at least one monomer and
 - a₅) optionally, a portion of at least one water-soluble free radical initiator are initially added to form a reaction mixture in the reaction vessel, thereafter
- b) the reaction mixture obtained is, optionally, heated to the starting reaction temperature T_S , and thereafter
- c) the following are metered into the reaction mixture:
 - c₁) optionally, the remaining amount of demineralized water,
 - c₂) optionally, the remaining amount of the at least one oil-soluble free radical initiator,
 - c₃) optionally, the remaining amount of the at least one dispersant,
 - c₄) the total amount or, optionally, the remaining amount of the at least one monomer and
 - c₅) the main amount of the at least one water-soluble free radical initiator, and

d) the reaction mixture is heated to an end reaction temperature T_E during the metering of the at least one monomer, and wherein

the at least one water-soluble free radical initiator has a solubility of $\geq 1\%$ by weight at 20°C and atmospheric pressure in demineralized water, and the at least one oil-soluble free radical initiator has a solubility of $< 1\%$ by weight under the process conditions and the total amount of water being such that the aqueous polymer dispersion obtained has a solids content of from 20 to 70% by weight,

the at least one water-soluble free radical initiator initiates a free radical polymerization reaction of the at least one monomer at the starting reaction temperature T_S , and

at least one oil-soluble free radical initiator has a half-life of ≥ 10 hours at the starting reaction temperature T_S and a half-life of ≤ 5 hours at the end reaction temperature T_E .

Claims 2-3 (Cancelled)

Claim 4 (Previously Presented): The process according to Claim 1, wherein $T_E \geq T_S + 10^\circ\text{C}$.

Claim 5 (Previously Presented): The process according to Claim 1, wherein T_S is from ≥ 30 to $\leq 120^\circ\text{C}$ and T_E is from ≥ 80 to $\leq 200^\circ\text{C}$.

Claim 6 (Previously Presented): The process according to Claim 1, wherein the amount of water-soluble and oil-soluble free radical initiator is in each case from 0.01 to 5% by weight, based on the total amount of monomer.

Claim 7 (Previously Presented): The process according to Claim 1, wherein the pressure during the polymerization is chosen so that the reaction mixture does not boil at any time.

Claim 8 (Previously Presented): The process according to Claim 1, wherein the at least one water-soluble free radical initiator used is a mono- or di-alkali metal or ammonium salt of peroxodisulfuric acid.

Claim 9 (Previously Presented): The process according to Claim 1, wherein the at least one oil-soluble free radical initiator used is at least one compound selected from the group consisting of tert-butyl peroxy-2-ethylhexanoate, tert-amyl peroxy-2-ethylhexanoate, tert-butyl peroxybenzoate, tert-amyl peroxybenzoate, tert-butyl peroxyacetate, tert-butyl peroxy-3,5,5-trimethylhexanoate, tert-butyl peroxyisobutanoate, tert-butyl peroxydiethylacetate, tert-butyl peroxy-pivalate, tert-butyl peroxyisopropylcarbonate, and tert-butyl peroxy-2-ethylhexylcarbonate.

Claim 10 (Previously Presented): The process according to Claim 1, wherein the reaction mixture is kept at the end reaction temperature T_E for at least a further 30 minutes after the end of the monomer metering.

Claim 11 (Previously Presented): The process according to Claim 1, wherein the reaction mixture is stripped with inert gas and/or steam after the end of the monomer metering.

Claims 12-13 (Cancelled)

Claim 14 (Previously Presented): The process according to Claim 1, wherein the dispersant is a protective colloid or an emulsifier.

Claim 15 (Previously Presented): The process according to Claim 1, wherein the total amount of the dispersant is from 0.1 to 5 wt.% based on the total amount of the monomer to be subjected to the free radical polymerization.

Claim 16 (Previously Presented): The process according to Claim 1, wherein an amount of water in a_1) is equal or less than 50 wt.% based on the total amount of water.

Claim 17 (Previously Presented): The process according to Claim 1, wherein an amount of the dispersant in a_3) is equal or less than 50 wt.% based on the total amount of the dispersant.

Claim 18 (Previously Presented): The process according to Claim 1, wherein the monomer is added in a_4) and an amount of the monomer is equal or less than 50 wt.% based on the total amount of monomer.

Claim 19 (Currently Amended): The process according to Claim 1, wherein the water-soluble free radical initiator is added in a_5) and an amount of the at least one water-soluble free radical initiator is equal or less than 30 wt.% based on the total amount of the water-soluble free radical initiator.

Claim 20 (Previously Presented): The process according to Claim 1, wherein an amount of the oil-soluble free radical initiator in a_2) is at least 50 wt.% based on the total amount of the oil-soluble free radical initiator.

Claim 21 (Previously Presented): The process according to Claim 1, wherein the metering of the at least one monomer is carried out from 10 minutes to 20 hours.

Claim 22 (Previously Presented): The process according to Claim 1, wherein the metering of the at least one water-soluble free radical initiator is carried out in such a way that at least 50 wt.% of the water-soluble free radical initiator is added during the monomer metering.